Solutions for Demanding Applications

# VarTech Systems Inc.

Industrial Flat Panel Displays

# VT170 DiamondVue/CrystalVue Series
## 17.0” Flat Panel Series LCD Monitors

VT170P2 · VT170PS2 · VT170R2 · VT170RX2
VT170PHB2 · VT170PSHB2 · VT170C2 · VT170CHB2
· VT170W2 · VT170WS2 · VT170WHB2 ·
VT170WSHB2

Read these instructions completely before attempting to operate your new LCD Color Display.

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# INTRODUCTION

# SECTION 1

## 1.1 VT170 Series Features

The VT170 Series is capable of displaying 16.8M colors in a continuous spectrum.

The VT170 Series provides a standard VGA input, a DVI-I input, an S-Video input, and a Composite input.

The VT170 Series is auto synchronous adjusting the display to the appropriate VGA input.

The VT170 Series is available in Chassis Mount, Panel Mount, Wall Mount, and Rack Mount configurations.

The VT170 Series is supplied with an Anti-Reflective Screen unless equipped with an optional Touch System.

The VT170 Series has either 110/220VAC input or optional +12V jack supply as standard.

## 1.2 Product Safety Precautions

- Ensure that sufficient space is available around the display to provide the circulation necessary for cooling.
- Ensure that the ambient air temperature will not exceed the specified maximum temperature.
- Do not attempt to service this display yourself. The rear chassis has a seal so that non qualified personnel will not expose themselves to dangerous voltages or other risks.
- To protect from electrical shock, unplug the display power supply from the wall before moving.
- Do not expose the display to direct sunlight or heat.
- Do not use this display near water.
- Do not place any heavy objects on the power cords. Damage may cause electrical shock.
- Unplug the power supply from the wall or unit if one of the following conditions exists:
  - Power cord or plug is damaged or frayed.
  - Liquid is spilled onto the display or the display is exposed to rain or water.
  - The display does not operate normally when the operating instructions are followed.
  - The display has been dropped or the enclosure has been damaged.
  - The display exhibits a distinct change in performance, indicating a need for service.

# DISPLAY SETUP

## SECTION 2

### 2.1 Inspection of your VT170 display

The VT170 is supplied with different accessories depending on the model configuration purchased. Verify the VT170 and accessories are what were ordered. Contact your Vartech salesperson should there be any discrepancies.

### 2.2 Unpacking and setting up your VT170 display

Your LCD monitor package will consist of the components listed below. Open shipping container and place all the components on a flat clean surface.

### 2.3 What is included with your VT170 display

VT170 LCD Monitor.
VGA Video Cable.
Power Cable for AC input (optional DC cable for DC input voltage).
Users Manual CDROM
Mounting Hardware, 10-32 Locking Nuts . (for Panel Mount units only)
Touch Interface Cable, Serial or USB (Optional when touch is installed)
CDROM with Touch Screen Drivers (Optional when touch is installed)

### 2.4 Connecting the VT170 display

1. Connect all cables to the computer first. This would include the VGA Video cable and any optional touch interface cable, serial or USB.
2. After connecting the cables between the LCD monitor and the computer, connect the Power Cable to the display and the customer supplied DC voltage source. Check the display unit label to determine the correct DC voltage.
3. Turn the DC voltage source on. The display will be active.
4. Turn on your computer. The display should now operate showing your OS or the video that is being supplied to the flat panel.

Note: If for any reason the display goes blank and gives an “Out of Range” or “No Input Signal”, your computer or video source is supplying a signal that is “out of range” of the LCD’s video board. If this happens, reboot the computer or video source and make sure you are supplying the correct video resolution and refresh signal. If the display doesn’t work properly, it may be because:

- The resolution is too high or low for the LCD.
- The refresh rate is set too high. Set the refresh rate to 60Hz.
- The power source is incorrect.
- The unit is malfunctioning. If you believe this to be true, disconnect the video cable from the LCD display and connect to a known working display. If the display is working satisfactory and the video is within the appropriate range, then contact Vartech Customer service for a RMA number at 800-223-8050.

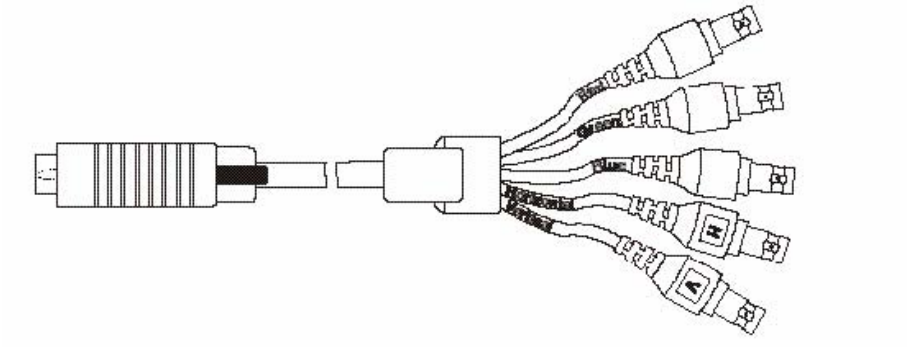
## 2.5 Input Video Connections

The VT170 Series provides four industry standard video inputs:

- Analog RGB (VGA) with auto detect of Digital Separate Sync, Sync-On-Green, and Composite Sync. Auto detects from VGA to UXGA, interlaced and non-interlaced video.
- DVI-D with auto detect of Digital Separate Sync.
- S-Video for 4 wire video
- Composite for NTSC, PAL, and SECAM video (interlaced)

Optional BNC Adaptor Cable

A HD15 (VGA)-to-5xBNC adapter cable is available. The functions of the cables are described below.
The R (Red), G (Green), and B (Blue) input connectors for color.
The HS/CS: Separate horizontal/composite sync signal from the video source.
The VS: Separate vertical sync signal from the video source.



BNC Adapter Cable
This table describes the signal types you can use with the connectors:

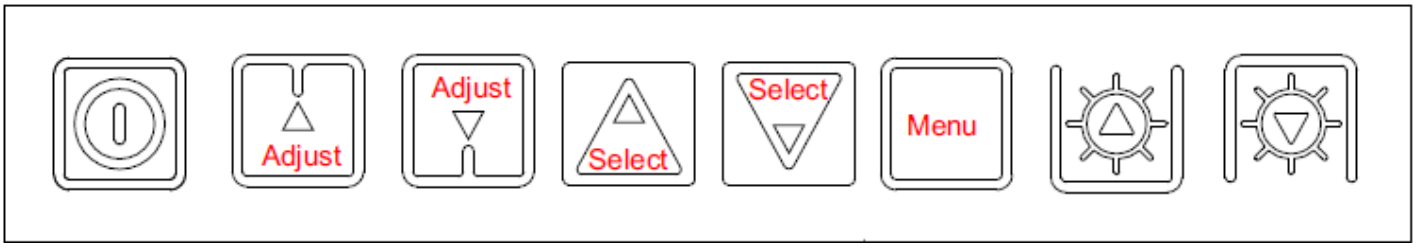
| BNC Signal Types | | | | | | |
|---|---|---|---|---|---|---|
| BNC Signal Type | Description | R | G | B | HS/ CS | VS |
| Sync-on-Green | Use the three video connectors. Horizontal and vertical syncs are supplied on the green video line. | X | X | X | | |
| Composite Sync | Use the three video connectors plus the horizontal sync/ composite sync input | X | X | X | X | |
| Separate Horizontal and Vertical Sync. | Use the three video connectors plus the horizontal sync/ composite sync and vertical sync input. | X | X | X | X | X |

# GETTING STARTED

## SECTION 3

### 3.1 Adjusting the display

Membrane Controls




| Controls | Analog VR type | Digital type |
|---|---|---|
| On/Off – turns controller board power on | VR toggle switch | On/Off button |
| Brightness – controls backlight brightness | Rotary VR | Brightness +/- buttons |
| Menu – turns OSD menu On or Off (it will auto time off) (Function with signal input only) | Menu button | Menu button |
| Select – Select function / Confirm (under OSD menu on state) | SEL DN | SEL DN |
| Move up to select individual RGB color level OSD page (under OSD menu on state) | SEL UP | SEL UP |
| + – increase the setting / moves the selector to the next function (under OSD menu on state) | + | + |
| - - decrease the setting / moves the selector to the previous function (under OSD menu on state) | - | - |
| Load factory default | Press and hold SEL DN button to power on the controller | Press and hold SEL DN button to power on the controller |
| Lock OSD menu (Function with signal input only) | Press and hold MENU button for 15 seconds to enable / disable lock of the OSD menu | Press and hold MENU button for 15 seconds to enable / disable lock of the OSD menu |
| Switch to next input source (under OSD menu off state) | + | + |

## 3.2 OSD Adjustments

**Picture :**

Volume Increase/decrease volume level, total 31 steps

Brightness Increase/decrease panel brightness level, total: 100 steps

Contrast Increase/decrease panel contrast level, total: 100 steps

Hue * Increase/decrease Hue level, total: 100 steps

Saturation * Increase/decrease saturation, total: 100 steps

Sharpness Increase/decrease sharpness, total: 15 steps

Aspect Size ▸

Aspect Ratio : Fill Screen / Fill Aspect / 1 to 1 (UNDER ARGB / DVI mode)

Auto / Fill Screen / 1 to 1 / Anamorphic (UNDER VIDEO MODE)

- Fill Screen : Enable full screen expansion for lower resolution Image
- Fill Aspect : Enable fill screen expansion for lower resolution image according to aspect ratio
- 1 to 1 : Display the exact image resolution on the screen without image expansion.

Horz Position Move the image position horizontally

Vert Position Move the image position vertically

Blue Only : OFF / ON : Turn off the "Red" & "Green" channel (i.e output all zero to Red & Green channel)

* : DISPLAY IN VIDEO MODE ONLY

**Main Source :** Select the input video signal

VGA 1 / Composite Video / S-Video / VGA 2 / DVI **/** HD/SD Component

**Utilities :**

**Setup** ▸

Auto Picture Setup# ▸ : Auto adjust the image position, phase and size

Auto Color Gain# ▸ : Auto Color Calibration (Function in ARGB mode ONLY – See appendix IV)

Manual Clock# : Adjust the image horizontal size

Manual Phase# : Fine tune the data sampling position (adjust image quality)

Auto Source Seek : OFF / ON

ON – Auto source select always enable

OFF – Disable auto source select function

Auto Power : OFF / ON

ON – Enable soft power off function if absence of input signals

OFF – Disable soft power function

Video Standard (SD)** : Auto / NTSC / PAL / SECAM / NTSC 443

Gamma : 1.0 / 1.6 / 2.2

**OSD** ▸

H Position : Move the OSD menu image horizontally

V Position : Move the OSD menu image vertically

Timeout (sec) : 1 – 20 : Adjust the OSD menu timeout period in a step of 1 seconds (max 20 seconds)

Language : English / Simplified Chinese : Select OSD menu language display

Transparency : 0 – 100 steps

| | |
|---|---|
| | **Color Temperature** ‣<br>Color Temp : 9300K / 8000K / 6500K / 5000K<br>Red : <br>Green : <br>Blue : <br><br>**Hot Key** ‣<br>Hot key 1 : Brightness / Contrast / Input / Aspect / Volume<br>Hot key 2 : Brightness / Contrast / Input / Aspect / Volume<br><br>**Reset to Factory Defaults** ‣<br>Factory Defaults<br>Reset Color Gain#<br>DDC Updates<br>** : FUNCTION IN VIDEO MODE ONLY<br># : DISPLAY AND FUNCTION IN VGA MODE ONLY |

Exit the OSD menu to save the setting chosen

# TOUCHSCREEN

# SECTION 4

## 4.1 Introduction

Touch screens are a common means to interface operator inputs to a system. The universal standard of Windows GUI (Graphical User Interface) has significantly increased the use of touch screens.

There are five main touch technologies. The technologies are resistive, surface acoustic wave (SAW), capacitive, infrared (IR), and projective capacitive. Each touch technology has advantages and disadvantages based on different user applications.

## 4.2 Installation

All Vartech Systems displays configured with a touch screen are supplied with a CDROM which includes user manuals, application software, and drivers for various operating systems. Insert the supplied CDROM into a CDROM drive and follow the installation instructions that will appear on the screen.

Technical support is available by contacting Vartech Systems customer support at 800-223-8050.

# TROUBLESHOOTING

## SECTION 5

### 5.1

**General**
A general guide to troubleshooting a flat panel display system it is worth considering the system as separate elements, such as: Controller (jumpers, PC settings) Panel (controller, cabling, connection, panel, PC settings) Backlight (inverter, cabling, backlight tubes) Cabling Computer system (display settings, operating system) Through step by step cross checking with instruction manuals and a process of elimination to isolate the problem it is usually possible to clearly identify the problem area.

**No image:**
If the panel backlight is not working it may still be possible to just see some image on the display. A lack of image is most likely to be caused by incorrect connection, lack of power, failure to provide a signal or incorrect graphic card settings.

**Image position:**
If it is impossible to position the image correctly, i.e. the image adjustment controls will not move the image far enough, then test using another graphics card. This situation can occur with a custom graphics card that is not close to standard timings or if something is in the graphics line that may be affecting the signal such as a signal splitter (please note that normally a signal splitter will not have any adverse effect).

**Image appearance:**
A faulty panel can have blank lines, failed sections, flickering or flashing display, incorrect graphics card refresh rate, resolution or interlaced mode will probably cause the image to be the wrong size, to scroll, flicker badly or possibly even no image. Incorrect jumper settings on the controller may cause everything from total failure to incorrect image. CAUTION: Do not set the panel power input incorrectly. Sparkling on the display: faulty panel signal cable.

**Backlight:**
Items to check include: Power input, Controls, Inverter and Tubes generally in this order. If half the screen is dimmer than the other half: Check cabling for the inverter. For a specific backlight tube check the AC pins orientation (CAUTION: Never reverse any DC power pins). Also: If adjusting brightness control has no effect the chances are that the VR rating or method of adjusting brightness is not compatible or correctly connected to the inverter. If system does not power down when there is a loss of signal

**Continued failure:**
If unit after unit keeps failing consider and investigate whether you are short circuiting the equipment or doing something else seriously wrong.

Generally after common sense issues have been resolved we recommend step by step substitution of known working parts to isolate the problem.

# MAINTENANCE

## SECTION 6

### 6.1 Cleaning

Occasionally clean the display panel and cabinet with a soft cloth dampened (not soaked) with a mild (non-abrasive) glass cleaner. Keep turning a fresh side of the cloth toward the screen surface to avoid scratching it with accumulated grit.

Note: The solvent should be applied only to the cloth, and not directly on the monitor screen.

Do not use paper products as they may scratch the surface. To minimize the risk of abrasion, allow the screen to stand dry. Special care should be taken when cleaning a touch screen or polycarbonate shield that is installed over the screen. Abrasive and certain chemical cleaners can easily damage the surface. Never use alcoholic or ammoniac cleaners to clean the polycarbonate shield or a touch screen.

Note: For best results cleaning a monitor with the optional antireflective tempered glass display shield, a solution of denatured alcohol is recommended to thoroughly clean the display.

Replacing a Line Cord
To avoid shock and fire hazards, the monitor's power cord should be replaced if the insulation becomes broken or if it develops a loose internal connection.

Other Maintenance
Qualified service personnel should perform all maintenance, except for the power cord replacement described above.

# MOUNTING INSTRUCTIONS

## SECTION 7

### 7.1 Panel Mount Procedure

| Mechanical Drawings | | |
|---|---|---|
| **Model** | **Description** | **Page(s)** |
| VT170P2 | 17" DiamondVue/CrystalVue Panel Mount Drawing (Nema 4) | 17-18 |
| VT170W2 | 17" DiamondVue/CrystalVue Wall/Vesa Mount Drawing | 19 |
| VT170R | 17” DiamondVue/CrystalVue Wall/Rack Mount Drawing | 20 |
| VT170RX2 | 17” DiamondVue/CrystalVue Military Grade Rack Mount Drawing | 21 |
| VT170PSS | 17” DiamondVue/CrystalVue Panel Mount SS Drawing (Nema 4x) | 22 |
| VT170C2 | 17” DiamondVue/CrystalVue Chassis Mount Drawing | 23 |

1. Cut and drill the panel (refer to panel mount drawing). Measurements are in inches.
2. If access to the side of the monitor is not available following installation, attach the power and video cables to the side of the monitor at this time.
3. Install the monitor in the prepared cutout.
4. Install the lock nuts and washers, supplied with the monitor, behind the holes running along the sides and top/bottom of the cutout in the panel. Extra lock nuts and washers are provided.

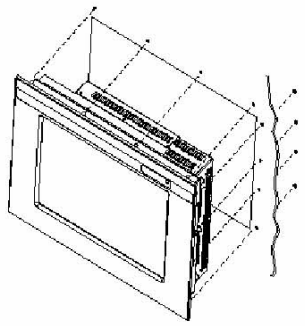
**Note:**
Use #10-32 nuts for mounting.

5. Tighten all mounting nuts evenly to a torque of 24 inch-pounds.

**ATTENTION:** Mounting nuts must be tightened to a torque of 24 inch-pounds to provide panel seal and avoid potential damage. Vartech Systems assumes no responsibility for water or chemical damage to the monitor or other equipment within the enclosure due to improper installation.

6. Attach the power and video cables to the side of the monitor if you have not already done so.

Generic Panel Mount Diagram



# SPECIFICATIONS

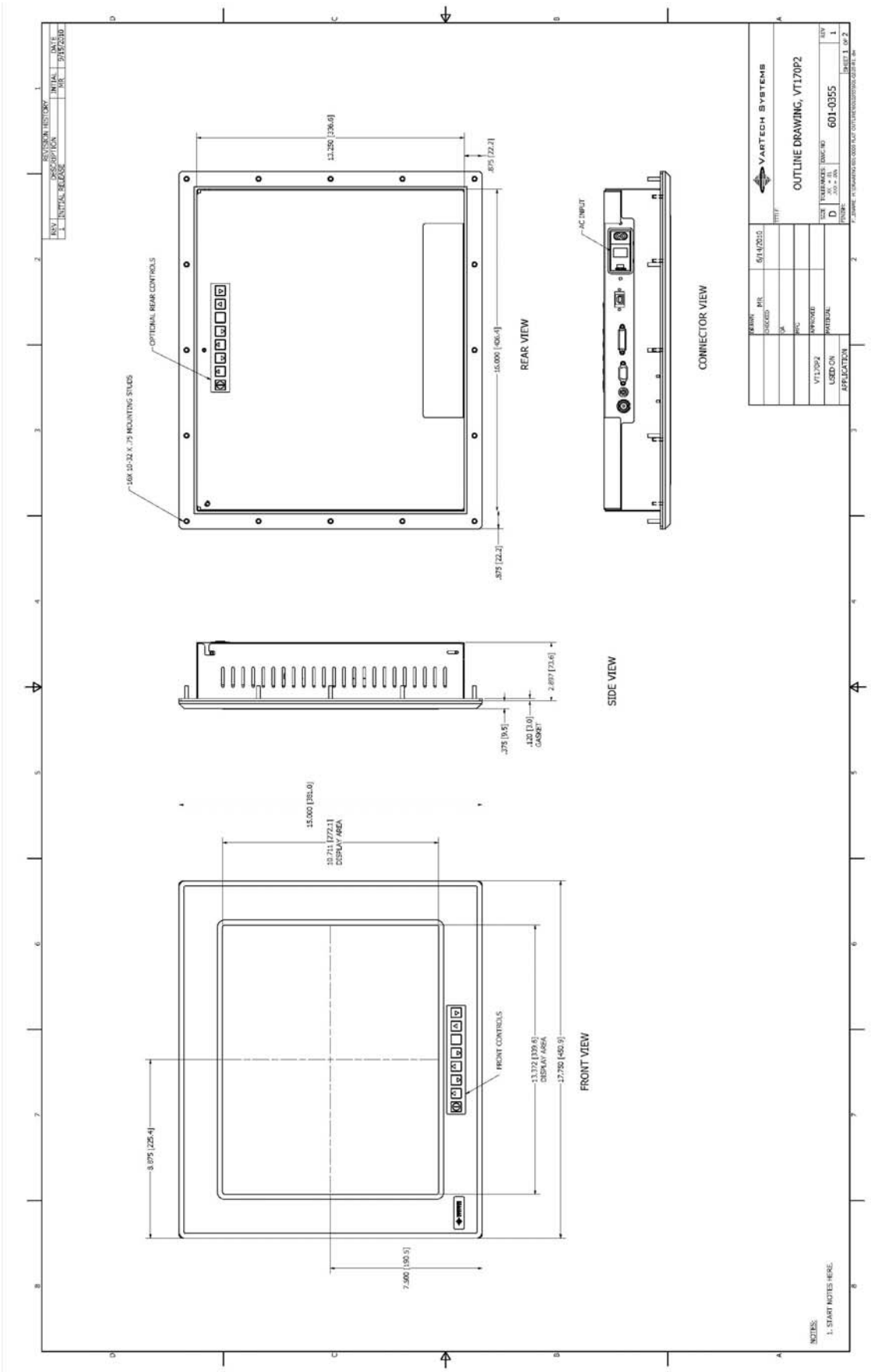
| ENGINEERING SPECIFICATIONS – DiamondVue | |
|---|---|
| Panel Size | 17.0” (43.2cm) |
| Type | Active Matrix Color Thin Film Transistor (TFT) |
| Native Panel Resolution | SXGA |
| Pixel Format | 1280x3 RGB (H) x 1024 (V) |
| Pixel Pitch | 0.264 per one triad (H) x 0.264 (V) mm |
| Pixel Arrangement | RGB (Red dot, Green dot, Blue dot) vertical stripe |
| Active Display Area | 13.304” x 10.643”<br>337.920mm x 270.336mm |
| Viewing Angle (Left/Right) | 85/85$^{o}$ (typ.) |
| Viewing Angle (Up/Down) | 80/80$^{o}$ (typ.) |
| Color Gamut | TCO03 Compliance |
| Brightness | 380 Nits (typ.) |
| Contrast Ratio | 1000:1 (typ.) |
| Response Time | 5ms (typ.) |
| Back Lights | 4 CCFL rated 50,000 Hrs. |
| Video Connectors | Analog VGA (DB-15), Composite (BNC),<br>DVI-I, Four Pin Mini-Pin (S-VIDEO) |
| Colors Supported | 16,777,216 (RGB 6-bit + Hi-FRC data) |
| Video Input | Analog 0.7v p-p, TTL |
| Sync | Separate H & V, Combined, SOG |
| Input Voltage | 110/220VAC (+12VDC optional) |
| Power consumption | 35 Watts |
| Temperature | Operating: 0 to 50ºC |
| | Storage: -20 to 60ºC |
| Humidity | Operating: 10 to 95%NC |
| | Storage: 10 to 95%NC |
| Operating Altitude | Operating: Up to 10,000 ft |
| | Storage: Up to 40,000 ft |

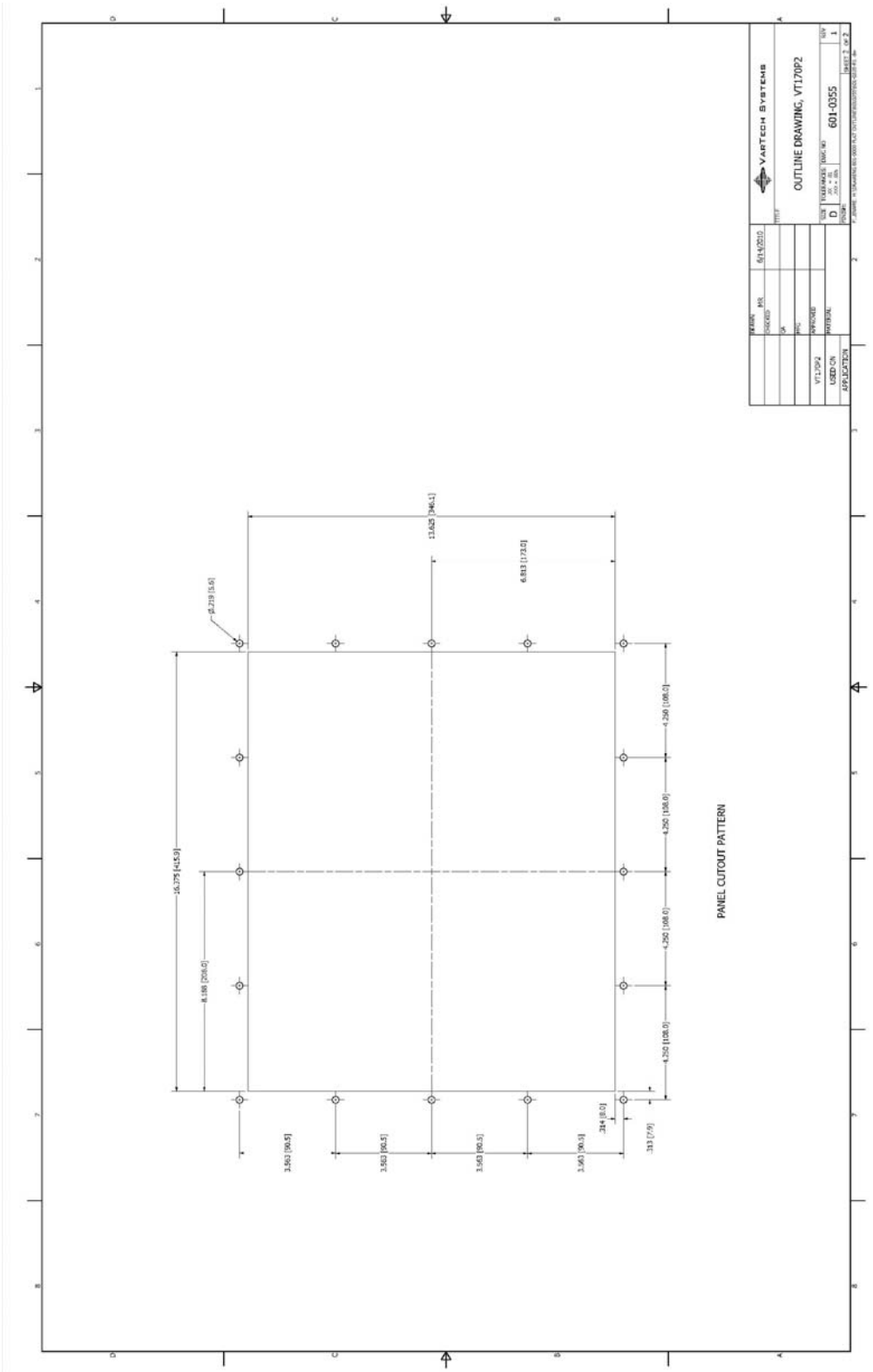
# SPECIFICATIONS

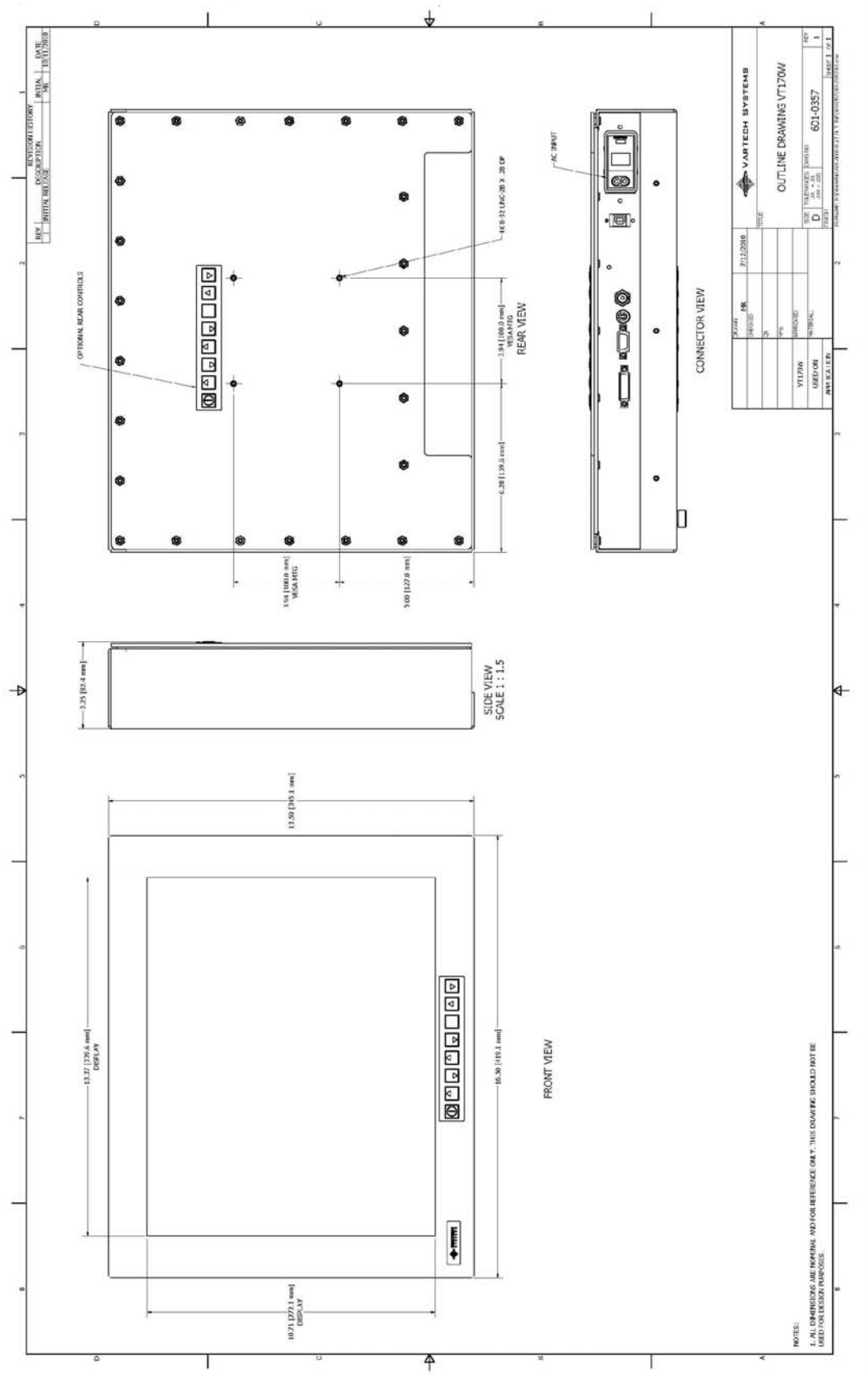
| ENGINEERING SPECIFICATIONS – Phantom | |
|---|---|
| Panel Size | 17.0” (43.2cm) |
| Type | a-Si TFT active matrix |
| Native Panel Resolution | SXGA |
| Pixel Format | 1280 (h) x 1024 (v) |
| Pixel Pitch | 0.264 (h) x 0.264 (v) mm |
| Pixel Arrangement | RGB (Red dot, Green dot, Blue dot) vertical stripe |
| Active Display Area | 13.30" (w) x 10.643" (h) / 337.92mm (w) x 270.336mm (h) |
| Viewing Angle (Left/Right) | 89/89$^{o}$ (typ.) |
| Viewing Angle (Up/Down) | 89/89$^{o}$ (typ.) |
| Brightness | 250 Nits (typ.) |
| Contrast Ratio | 1500:1 (typ.) |
| Response Time | 5ms (typ.) |
| Back Lights | 2 dual CCFTs (Cold Cathode Fluorescent Tube) |
| Video Connector Type (All inputs) | MIL-DTL-383999 Series III |
| Colors Supported | 16.7 million colors |
| Video Input | HD15(F), DVI-I, BNC, 5 Pin Mini Din (S-Video), Other Configurations Available |
| Sync | Separate H & V, Combined, SOG |
| Input Voltage | Standard: 9-36VDC, or optional 90-264V AC Power |
| Power consumption | 35 Watts |
| Temperature | Operating: -20°C to +50°C (32°F to +122°F) |
| | Storage: -40° to +75°C (-40°F to 167°F) |
| Humidity | Operating: 10 to 95%NC |
| | Storage: 10 to 95%NC |
| Operating Altitude | Operating: Up to 10,000 ft |
| | Storage: Up to 40,000 ft |

# SPECIFICATIONS

| ENGINEERING SPECIFICATIONS – CrystalVue | |
|---|---|
| Panel Size | 17.0” (43.2cm) |
| Type | Active Matrix Color Thin Film Transistor (TFT) |
| Native Panel Resolution | SXGA |
| Pixel Format | 1280x3 RGB (H) x 1024 (V) |
| Pixel Pitch | 0.264 per one triad (H) x 0.264 (V) mm |
| Pixel Arrangement | RGB (Red dot, Green dot, Blue dot) vertical stripe |
| Active Display Area | 13.304” x 10.643”<br>337.920mm x 270.336mm |
| Viewing Angle (Left/Right) | 85/85$^{o}$ (typ.) |
| Viewing Angle (Up/Down) | 80/80$^{o}$ (typ.) |
| Color Gamut | TCO03 Compliance |
| Brightness | 1000 Nits (typ.) |
| Contrast Ratio | 1000:1 (typ.) |
| Response Time | 5ms (typ.) |
| Back Lights | 2 LED Rail rated 70,000 Hrs. |
| Video Connectors | Analog VGA (DB-15), Composite (BNC),<br>DVI-I, Four Pin Mini-Pin (S-VIDEO) |
| Colors Supported | 16,777,216 (RGB 6-bit + Hi-FRC data) |
| Video Input | Analog 0.7v p-p, TTL |
| Sync | Separate H & V, Combined, SOG |
| Input Voltage | 110/220VAC (+12VDC optional) |
| Power consumption | 60 Watts |
| Temperature | Operating: -10 to 50ºC |
| | Storage: -20 to 60ºC |
| Humidity | Operating: 10 to 95%NC |
| | Storage: 10 to 95%NC |
| Operating Altitude | Operating: Up to 10,000 ft |
| | Storage: Up to 40,000 ft |


OUTLINE DRAWING, VT170P2
601-0355
VARTECH SYSTEMS
REAR VIEW
CONNECTOR VIEW
SIDE VIEW
FRONT VIEW
OPTIONAL REAR CONTROLS
16X 10-32 X .75 MOUNTING STUDS
AC INPUT
FRONT CONTROLS
DISPLAY AREA
NOTES:
1. START NOTES HERE.


VARTECH SYSTEMS
OUTLINE DRAWING, VT170P2
601-0355
PANEL CUTOUT PATTERN


VARTECH SYSTEMS
OUTLINE DRAWING VT170W
601-0357
REAR VIEW
SIDE VIEW
SCALE 1 : 1.5
FRONT VIEW
CONNECTOR VIEW
OPTIONAL REAR CONTROLS
AC INPUT
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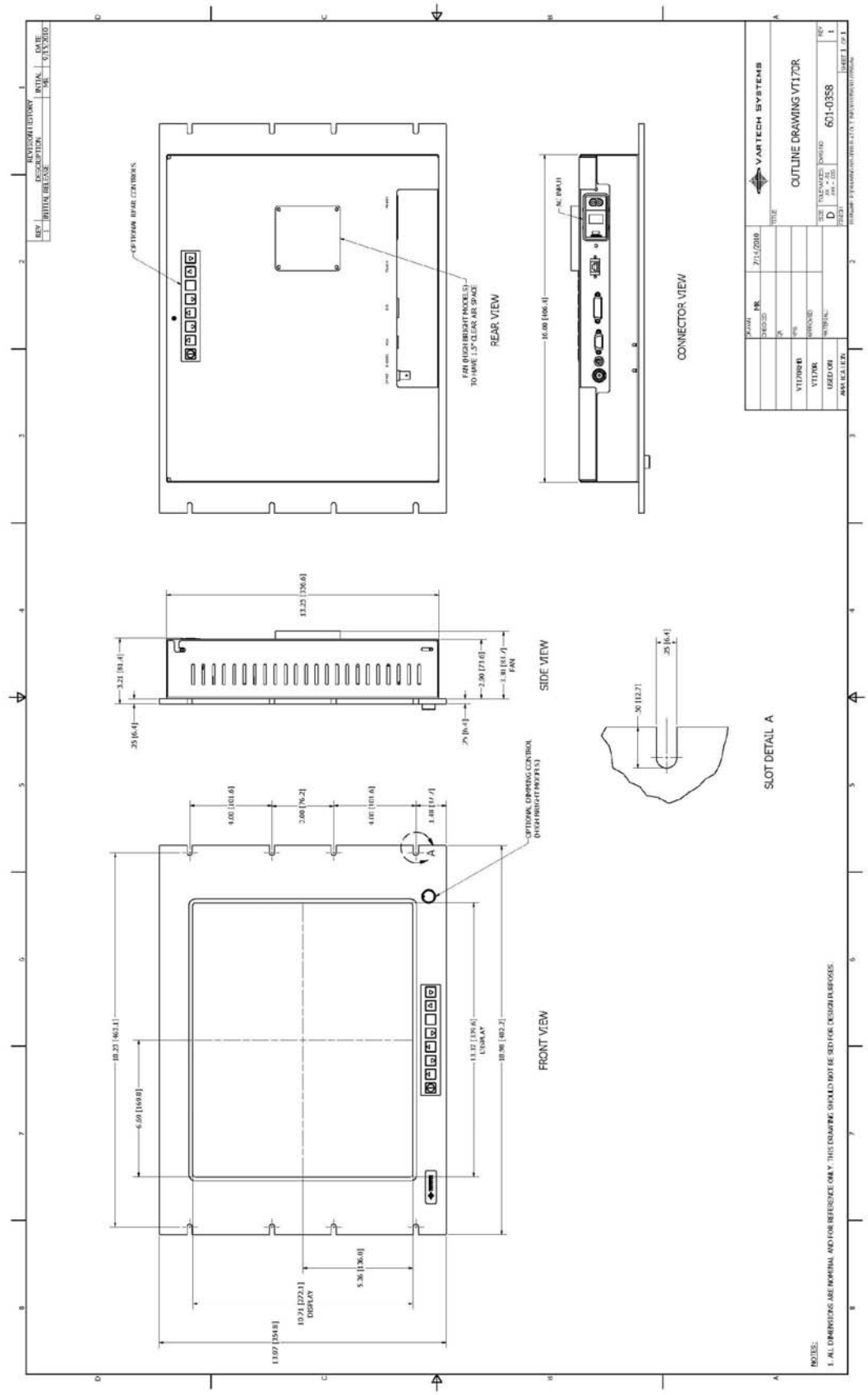
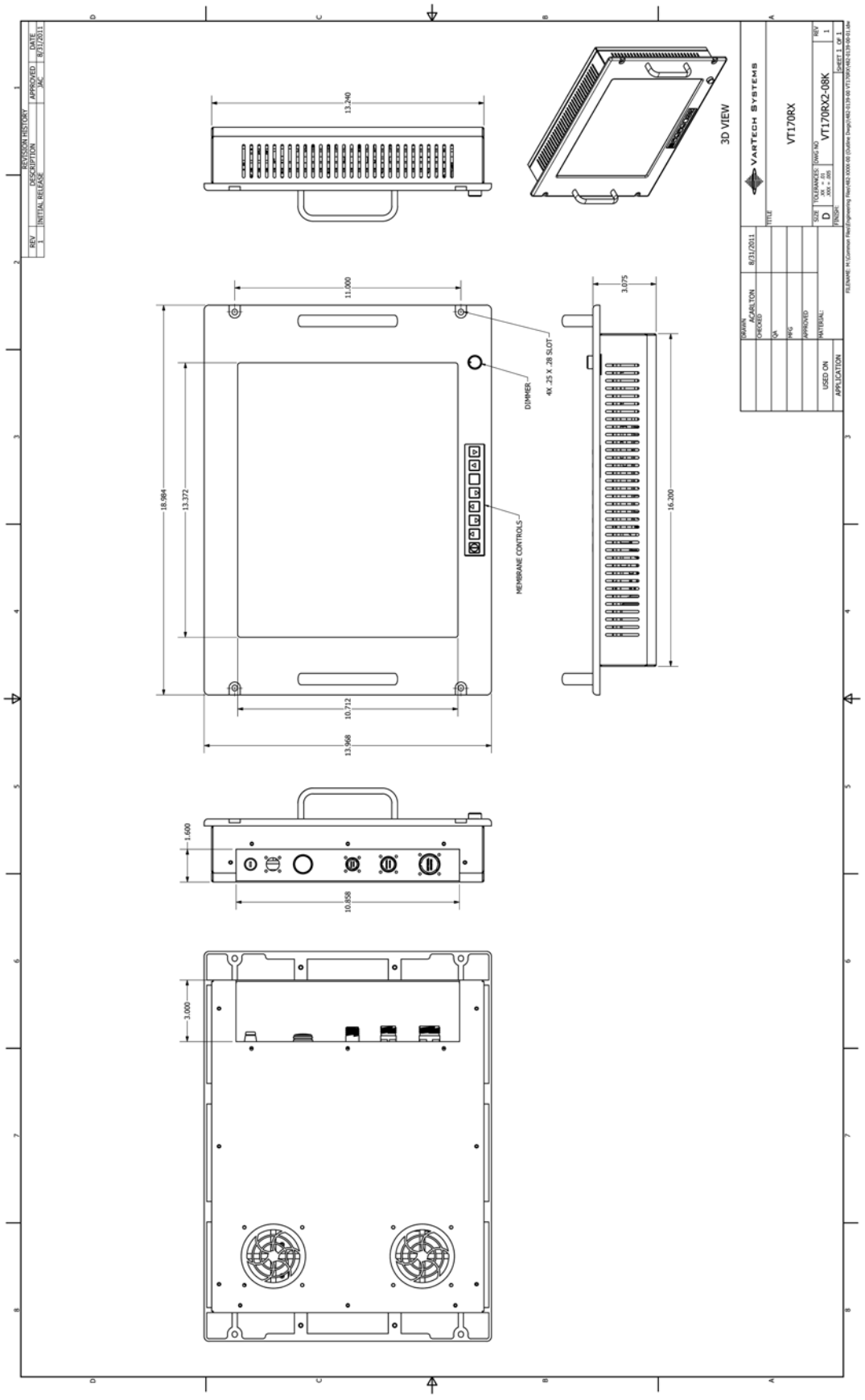
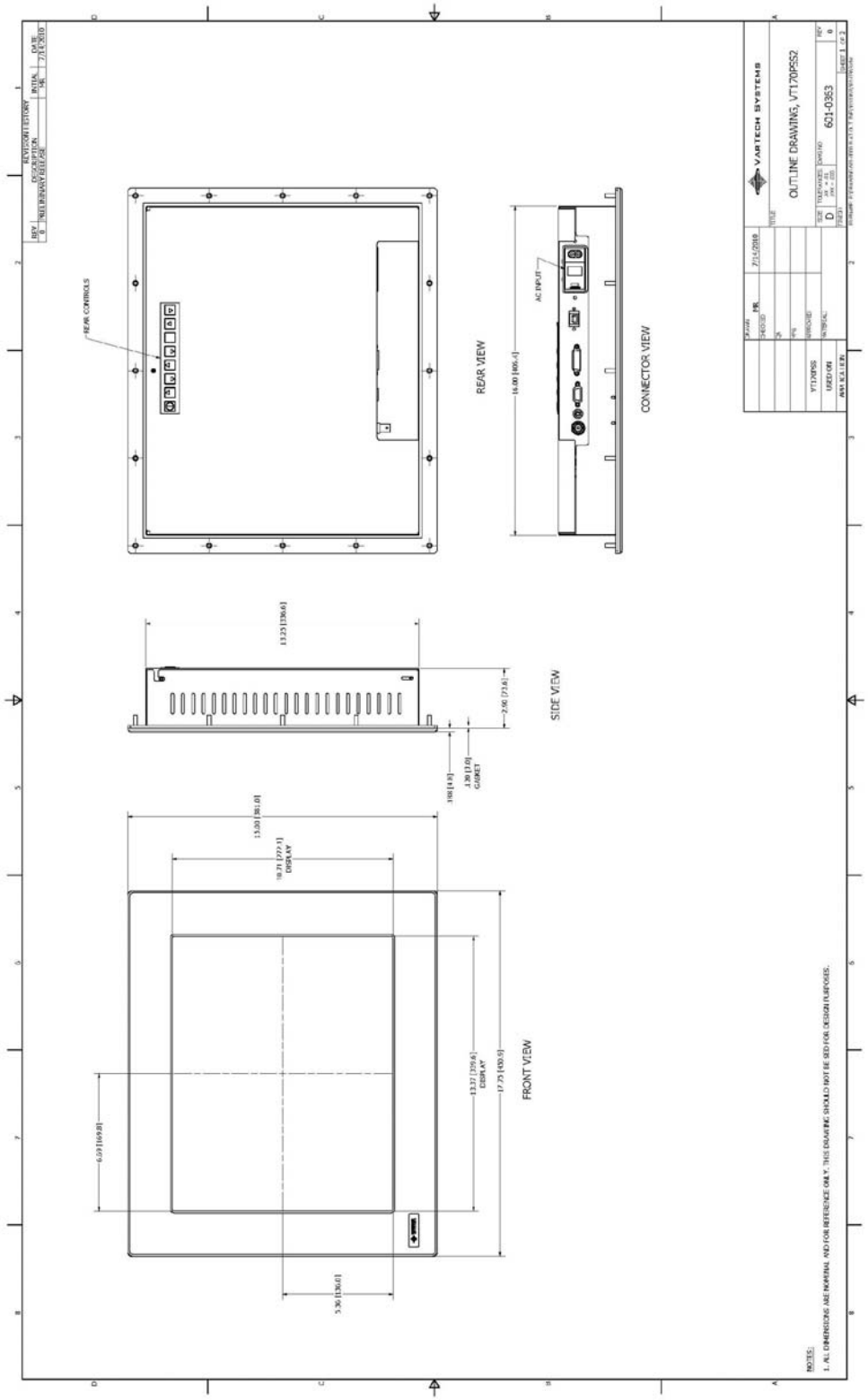

REAR VIEW
CONNECTOR VIEW
SIDE VIEW
SLOT DETAIL A
FRONT VIEW
OUTLINE DRAWING VT170R
VARTECH SYSTEMS
631-0358


3D VIEW
VARTECH SYSTEMS
VT170RX
VT170RX2-08K
13.240
11.000
3.075
DIMMER
4X .25 X .28 SLOT
MEMBRANE CONTROLS
18.984
13.372
16.200
10.712
13.968
1.600
10.858
3.000


REAR CONTROLS
REAR VIEW
AC INPUT
CONNECTOR VIEW
SIDE VIEW
FRONT VIEW
VARTECH SYSTEMS
OUTLINE DRAWING, VT170PSS2
621-0363
VT170PSS
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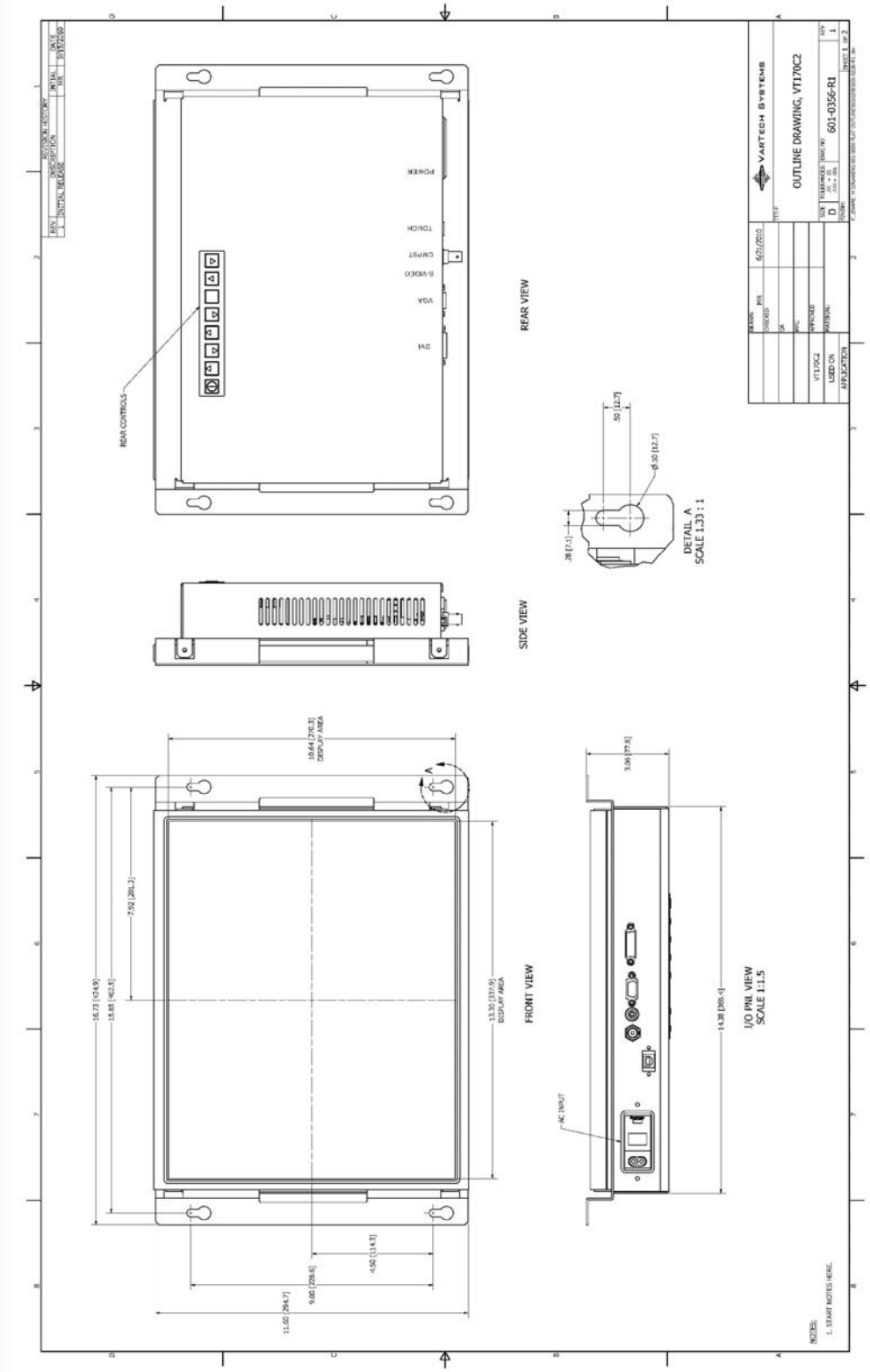
REAR VIEW
SIDE VIEW
FRONT VIEW
I/O PNL VIEW
SCALE 1:1.5
DETAIL A
SCALE 1.33 : 1
OUTLINE DRAWING, VT170C2
601-0356-R1
VARTECH SYSTEMS

VARTECH SYSTEMS INC.
HEADQUARTERS
6399 Amp Drive, Clemmons, NC 27012
Toll-Free: 800.223.8050
International Phone: 001.225.298.0300
Fax: 225.297.2440

E-mail: sales@vartechsystems.com

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10.03.2012